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Name _____ Class _____ Date _____

Skills Worksheet

Active Reading

Section: Chemistry of Cells

Read the passage below. Notice that the sentences are numbered. Then answer the questions that follow.

[1] **Carbohydrates** are organic compounds made of carbon, hydrogen, and oxygen atoms in the proportion of 1:2:1. [2] Carbohydrates are a key source of energy, and they are found in most foods—especially fruits, vegetables, and grains. [3] The building blocks of carbohydrates are single sugars called **monosaccharides,** such as glucose, $C_6H_{12}O_6$, and fructose. [4] Glucose is a major source of energy in cells. [5] Disaccharides are double sugars formed when two monosaccharides are joined. [6] For example, sucrose, or common table sugar, consists of glucose and fructose. [7] Polysaccharides are chains of three or more monosaccharides. [8] A polysaccharide is an example of a macromolecule, a large molecule made up of many smaller molecules.

SKILL: READING EFFECTIVELY

Read each question, and write your answer in the space provided.

1. What elements form an organic compound classified as a carbohydrate?

_____

_____

2. What does the *2* represent in the proportion given in Sentence 1?

_____

_____

3. What three food groups are good sources of carbohydrates?

_____

_____

4. The prefix *mono-* means "one." What word in Sentence 3 contains this prefix? What is the meaning of this word?

_____

_____

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Active Reading *continued*

5. What chemical formula is given in Sentence 3? How many atoms are in a molecule of this compound?

6. The prefix *di-* means "two." What term in Sentence 5 contains this prefix? What is the meaning of this term?

7. In Sentence 6, which two monosaccharides join to form table sugar?

8. The prefix *poly-* means "more than one." What term in Sentence 7 contains this prefix? What is the meaning of this term?

In the space provided, write the letter of the term or phrase that best completes the statement.

_____ **9.** An example of a macromolecule is a(n)
- **a.** oxygen atom.
- **b.** monosaccharide.
- **c.** glucose molecule.
- **d.** polysaccharide.

3. It is a key vocabulary word that is defined in this sentence
4. Covalent bonds that join atoms in molecules are similar to rivets and welds that join girders in a skyscraper.
5. b

SECTION: WATER AND SOLUTIONS

1. acids and bases; they appear in boldface type
2. Acids are compounds that form hydrogen ions when dissolved in water. Bases are compounds that reduce the concentration of hydrogen ions in a solution.
3. The concentration of hydrogen ions in the solution is increased above that of pure water.
4. **a.** form hydrogen ions when dissolved in water; have pH values below 7
   b. form hydroxide ions when dissolved in water; have pH values above 7
   c. water-soluble compounds
5. b

SECTION: CHEMISTRY OF CELLS

1. carbon, hydrogen, and oxygen
2. two atoms of hydrogen to each atom of carbon and oxygen
3. fruits, vegetables, grains
4. monosaccharide; single (one) sugar
5. $C_6H_{12}O_6$; 24 atoms
6. disaccharides; two joined monosaccharides
7. glucose and fructose
8. polysaccharides; three or more monosaccharides joined in a chain
9. d

SECTION: ENERGY AND CHEMICAL REACTIONS

1. A substrate is a substance on which an enzyme acts. Active sites are pockets on an enzyme's surface into which the enzyme's substrate fits.
2. starch
3. its shape
4. **a.** The substrate is attaching to an enzyme's active site.
   b. The enzyme reduces the activation energy of the reaction, and the reaction occurs.
   c. Products form and are released, signaling that the reaction is complete.
5. a

Vocabulary Review

1. c
2. a
3. b
4. g
5. f
6. h
7. d
8. e
9. substrate
10. carbohydrate
11. monosaccharide
12. lipid
13. protein
14. nucleotides
15. nucleic acid
16. Acids are compounds that form hydrogen ions when dissolved in water. Bases are compounds that reduce the concentration of hydrogen ions when dissolved in water.
17. Cohesion is an attraction between substances of the same kind. Adhesion is an attraction between different substances.
18. An enzyme is a substance that speeds up chemical reactions. An active site is the location on an enzyme that binds to a substrate.
19. Energy is the ability to move or change matter. Activation energy is the energy needed to start a chemical reaction.
20. DNA is a nucleic acid that stores hereditary information used to make proteins. RNA is a nucleic acid that is involved in protein synthesis.
21. ATP is an organic molecule that acts as the main energy currency of cells. Carbohydrates are organic molecules that act as a source of energy in cells.

Science Skills

ANALYZING INFORMATION/ INTERPRETING GRAPHS

1. The polar ends of the soap molecules are attracted to the water and pull the soap into the water. The nonpolar ends of soap molecules are attracted to the oil. The oil then mixes with the